DOCUMENT RESUME

ED 253 193 IR 011 469

TITLE	UNISIST Working Group on Technology of Systems Interconnection. Meeting (3rd, Quezon City, Philippines, October 17-20, 1983).
INSTITUTION	United Nations Educational, Scientific and Cultural Organization, Paris (France). General Information Programme.
REPORT NO	PGI-83/CONF.801/3
PUB DATE	Jan 84
NOTE	43p.; Annexes contain light, broken type.
PUB TYPE	Collected Works - Conference Proceedings (021)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	*Databases; *Developing Nations; Foreign Countries; *Information Networks; *Information Services; *Information Systems; International Organizations; Program Development; Program Implementation; Technology Transfer; *Telecommunications
IDENTIFIERS	Asia Pacific Region; Scientific and Technical Information

ABSTRACT

Participants in the meeting summarized in this report advised and made recommendations on appropriate activities and programs conducive to the development of cooperative networks and the exchange of information and experience in science and technology in the Asia Pacific Region. Invited in their personal capacity as experts, the 14 participants came from 12 countries--Australia, Austria, Brazil, Canada, Cook Islands, India, Japan, Luxembourg, Italy, The Philippines, Thailand, and the United States. Specializations represented included computerized information systems design and development, information services provision, networkings, systems compatibility, telecommunications, and public data networks. Brief descriptions cover the election of officers, remarks of chairman Peter Judge (Australia), reports on the Asian Regional Seminar on Local Databases and Their Use (held in Quezon City, October 10-14, 1983), five technical sessions, and three group discussions on databases which focused on information systems and services, the compatibility issue, and telecommunications and networking. Recommendations are listed by topic area. Also included is a report of the sub-group on telecommunications and networking, which proposes a communications network linking UNESCO-affiliated organizations in the Asia Pacific Region. Annexes include a list of participants and related documents, the text of opening remarks by A. Neelameghan, an agenda, and an expanded summary of the earlier seminar on local databases. (LMM)

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ED253193

PGI-83/CONF.801/3
PARIS, January 1984
Original : English

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UNISIST WORKING GROUP

ON TECHNOLOGY OF SYSTEMS INTERCONNECTION

REPORT OF THIRD MEETING

QUEZON CITY, PHILIPPINES, 17-20 October 1983

(PGI-83/CONF.801/COL.2)

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1. INTRODUCTION

01 Unesco, within the Programme and Budget of its General Information Programme (PGI) for 1983, convened the Third Meeting of the UNISIST Working Group on the Technology of Systems Interconnection in Quezon City, Phillipines, from 17 to 20 October 1983. The meeting was hosted jointly by the National Science and Technology Authority (NSTA) of the Phillipines and the University of the Phillipines, Institute of Library Science.

02 As a category VIII meeting, the participants were invited in their personal capacity as experts. Specializations represented included computerized information systems design and development, information services provision, networking, systems compatibility, telecommunications and public data networks. Observers representing the International Labour Organization, the International Council of Scientific Unions, the International Federation for Documentation and local organizations such as the National Science and Technology Authority, the National Computer Center and the Technology Resource Center, were present. A list of the participants and observers is given in Annex 1.

03 To facilitate the discussions, a working document on the 'Use of Modern Technology in Information Systems and Services: Some Issues and Options with Particular Reference to the Asia-Pacific Region' by Mr. F.V. Mahon and several other background documents on topics relevant to the meeting were provided. A list of the documents is given in Annex 2. In addition, a synthetic report of the papers and proceedings of the Asian Regional Seminar on Local Data Bases and Their Use, held in Quezon City, 10-14 October 1983, prepared by Dr. Jose-Marie Griffiths, was provided as a useful input to the Working Group meeting.

2. OPENING SESSION

04 In welcoming the participants and observers on behalf of the NSTA and the UP Institute of Library Science, Dr. Ursula G. Picache, Dean of the Institute,

recalled the recommendations of the first two meetings of the Working Group held in Paris in 1976 and 1980, and emphasized the timeliness of the present meeting in view of the recent preoccupations of the Member States in the region and of Unesco to implement the project on a Regional Network for the Exchange of Information and Experience in Science and Techjology in Asia and the Pacific (ASTINFO).

05 Mr. A. Neelameghan welcomed the participants and observers on behalf of the Director General of Unesco and indicated that the group was expected to advise and make recommendations to Unesco, and through Unesco to Member States, on appropriate activities and programmes conducive to the development of cooperative networks for the exchange of information and experience, in science and technology, for development both within and among Member States, especially the developing countries of the Asia Pacific Region. He thanked Minister Emil Q. Javier, Director General of NSTA and other designated officers and Dean Picache and her colleagues at the Institute of Library Science, for hosting the meeting. The text of his opening remarks is given in Annex 3.

06 A telex message to the meeting from Mr. Jacques Tocatlian, Director, PGI, was read (Annex 4).

07 In his opening remarks, Dr. Jose Guerrero, Director, Science Promotion Institute, NSTA, welcomed the participants on behalf of [illegible]. Javier. He underlined the importance of the discussions of the meeting <u>vis a vis</u> the problems, opportunities and challenges posed by the information explosion and the new information technologies in general and the ASTINFO project in particular. He then read out a message from Dr. Javier.

Election of Officers

08 Following introduction of the participants and observers, Mr. Peter Judge (Australia) and Mr. Norman Abramson (USA) were nominated and elected as Chairman and Vice-Chairman respectively. Dr. Jose-Marie Griffiths was

designated Rapporteur and was earlier contacted to prepare the report of the meeting.

Chairman's Remarks

09 In his opening remarks, the Chairman recalled the deliberations at the ASTINFO Consultative meeting in Nanjing (People's Republic of China), 3-5 October 1983 on the institutional framework, governing mechanisms, implementation strategy, financing, etc. of the proposed regional network, the findings of the Asian Regional Seminar on Local Data Bases and Their Use, held in Quezon City the preceding week, and the focus of the Working Group meeting on the options for planned and practical steps for cooperation and systems interconnection and networking to achieve the objectives of ASTINFO.

10 The provisional agenda prepared by the Secretariat was accepted with some modifications (Annex 5).

Report of the Regional Seminar on Local Data Bases

11 Dr. Griffiths presented a draft report of the proceedings of the Asian Regional Seminar on Local Data Bases held the previous week. The following major issues or problem areas of relevance to regional cooperation and networking were identified:

- Definition and scope of 'local data base'
- Managerial aspects
- Hardware interconnection
- Software-related issues
- Data communications
- Microcomputer applications
- Marketing of information services
- Information personnel development

The text of the report is given in Annex 6. The specific issues raised under each of the major problem areas served as a checklist of possible items for discussion by the Working Group.

3. TECHNICAL SESSIONS

12 There were five Technical Sessions at which papers were presented and discussed as indicated in the agenda. The presentations were led by Mr. Mahon highlighting the ideas and suggestions for developing data networks contained in his working paper for the meeting.

Papers presented indicated the potential and current trends in data communication and information transfer. In addition to the EURONET experiences presented by Mr. Mahon, the IIASA gateway system, the intercountry networking developments and the variety of use of computer networks and videotext systems at IIASA were presented using a specially prepared slide-cum-lecture by Dr. Sebestyen. The use of low cost satellite technology for inter-island communication and information transfer, messaging, computer to computer link up, teleconferencing, facsimile, etc. in the Pacific region was presented by Mr. Kingan; he arranged for a brief demonstration of such communication on site. The PEACESAT operations appear to have been quite successful. Telecommunications and data communication prospects in Thailand were reviewed by Mr. Seshasayee. The Australian network and gateway system were presented by Mr. Judge, while the science information network being developed at the Tsukuba University was outlined by Mr. Tabata. The issues on systems compatibility and the use of norms and standards in information processing, information exchange, the Unesco-ISO contributions in this area and the requirements of user-friendly systems were covered by Dr. Romerio, Dr. Koch, and Prof. Simmons. Each presentation was followed by discussions, sometimes intensive and lengthy but generally at a high level, and focussed on systems interconnections issues.

4. SMALL GROUP DISCUSSIONS

13 Three small groups were formed to discuss specific issues raised during the meeting with particular reference to ASTINFO. The topics assigned were as

follows:

Group I	Databases, information systems and services
Group II	Compatibility issue
Group III	Telecommunications and networking

In the plenary session earlier a number of specific problems and issues were identified for each of the topic areas. The groups were expected to make recommendations separately which after discussion at plenary session could contribute toward the recommendations of the Working Group as a whole. The groups met separately to discuss, within the framework of ASTINFO, the problems and issues relating to systems' interconnection. Group I focussed on the variety of database types (bibliographic, numeric, full text, fact, graphic, etc.) that should be developed and which would have local and/or regional significance; alternative mechanisms for acquiring/accessing externally available databases; document delivery systems; messaging systems; and the identification of duplications or omissions in the provision of databases and other information ssytems or services within the region. Group II concentrated on the issues of compatibility that would affect the development of ASTINFO and identified two groups of topics for discussion.

The first group of topics relate to those areas requiring minimum standards to ensure system compatibility. They are: bibliographic description, data formats, computer software (operating systems, programming languages, command language, non-Roman scripts, criteria for software package selection), media for data storage, criteria for hardware selection; systems interconnection (ISO/OSI model, external databases). The second group of topics related to management issues: documentation and distribution of standards, education and training, human resources, adoption/application of standards. Group III, in discussing telecommunications and networking issues decided to focus on a possible ASTINFO pilot project to provide the context for their consideration of potential problems and their solution.

5. RECOMMENDATIONS

Databases, Information Systems and Services

14 In order to ensure the relevance and maximal use of local data bases in the countries of the region, data bases should be developed as integral components of information systems and services including, for example, libraries, extension/liaison services, document delivery systems and publications. Data bases covering a wide range of subjects as well as those covering only specific subjects should be developed in priority areas identified by CASTASIA II. The decision on the type of data base to be developed — bibliographic, numeric, fact and full text — should take into consideration the size of the potential database and target market, and availability of appropriate hardware and software.

15 Recognizing that there is a growing demand for numerical and statistical data bases, and library and information services in the region heretofore have made only sporadic attempts to prepare and provide such data bases, special attention should be paid in Member States for the development of numerical and statistical data bases and to the provision of access to a wide range of them.

16 Member States in the Asia Pacific region, through appropriate agencies and in collaboration with Unesco within the framework of ASTINFO, should compile information and factual data on microcomputer hardware and software and their use for information storage and retrieval and library applications in the region, to provide a base for the planning and establishment of compatible microcomputer-based information handling and library application practices.

17 Recognizing that on the one hand governments wishing to transfer technology into the country can do so through the use of external data bases and on the other the cost involved in such a procedure is quite high, it is necessary that governments should either fully fund or partially subsidise the cost involved in the provision of nationwide information services.

18 The design of the regional information network should accommodate a messaging system which has been demonstrated to be a viable and economic method of information exchange.

19 The existence of a national focal point helps in the coordinated development of national information policies and infrastructure and cooperation with international and regional bodies; therefore, Member States in the region that have not yet established such focal point should do so as early as possible and those existing focal points that have not been active should be stimulated and reactivated in order to accelerate the processes of national information infrastructure development and regional cooperative networks.

20 Unesco, in collaboration with Member States, should initiate action to inventory the software packages available and in use for library and information processing work in the institutions in the region, to supplement the Unesco study report by Valls on information services and to provide a basis for planning computerized systems within the network.

21 Noting that only a few information specialists and others involved in data bases development and computerization of library and information handling activities are aware of and use norms and standards, Unesco should adopt appropriate methods and marketing channels to improve the dissemination and distribution of its reports, guidelines, norms, standards and other publications in information handling.

22 Recognizing the need for more information on the financing of information services, Unesco should provide guidelines on the mechanisms used for supporting the purchase of information services, especially the purchase of foreign data bases for national/local use and online access to remote data bases through public data networks and international record carriers. Guidelines should be developed on the basis of the data gathered which would also serve to sensitize users to the fact that there are costs associated with acquiring and processing and that information retrieved has value.

23 Recognizing that non-awareness and therefore non-use of appropriate marketing techniques has resulted in the low use of information and information services, it is urged that Unesco support and assist the wide dissemination and distribution of papers and reports on information marketing especially those generated from the seminars it supports on the subject.

24 The new information technology is raising new issues and problems in information transfer and use that are of particular concern to developing countries. Unesco, in association with other appropriate agencies, should prepare study reports of the impact of the new technologies on such matters as copyright, privacy, responsibilities of information providers, transborder flow, etc. and the attitudes of Member States to these matters.

25 The problem of availability of information personnel of various categories in adequate number and quality will be accentuated with the wider use of information technology in the region. Therefore, Unesco activities in the region for the development of human resources in the information field should be strengthened and expanded, and promote among Member States the concept of education for the 'information society' at an early stage in school and college curricula.

Compatibility, Norms and Standards vis a vis Information Systems

Bibliographic Description

26 Libraries and information systems should make use of the International Standard Bibliographical Descriptions (ISBDs) and all organizations should endeavour to include in their bibliographic descriptions at least those data elements designated as mandatory by the Common Communication Format (CCF) being formulated by Unesco; these include

Record identifier	Title/Key title (serial)
Character set	Author
Language and script	Place of publication
ISBN/ISSN	Date of publication

Data Format

27 The data formats used should incorporate the maximum possible compatibility with existing international data formats based on ISO 2709.

28 As no clear standards for exchange of non-bibliographic data exist, Member States should initiate action for the establishment of such standards and encourage closer cooperation among various bodies currently attempting to establish such standards, e.g., ISO TC97, TC46 and IFIP, also taking into account data exchange formats established by the International Oceanographic Commission and the CCOP Working Group on Petroleum data.

29 Portability should be the prime criterion for the selection of operating systems and programming languages especially for microcomputers and mimi-computers. As the technical approach selected by the Institut fuer Maschinelle Dokumentation, Graz (Austria) for the development of the IV+V software supported by Unesco allows for the maximum possible portability among various computers, participants in ASTINFO are urged to monitor this development closely and to make use of the resulting software.

30 As a variety of scripts are in use within the Asia Pacific region, for the purposes of information exchange it is recommended that transliterated, translated or a common symbol set version of the CCF mandatory elements be provided.

31 Unesco should initiate action to develop guidelines for the selection of microcomputer hardwqare and software to assist Member States. In this connection it is noted that Unesco would issue a directory of software packages in 1984 and that a project is underway to prepare a directory of information handling equipment and guidelines for and directory of logistic services for computer systems.

32 The command language selected should provide for functional compatibility over a range of information and documentation systems; therefore, information

specialists and computer specialists should make use of software packages that use existing common command languages.

33 Information specialists should encourage the development and use of acceptable standards for coding non-Roman scripts and transliterations, such as those in the ISO International Register of Coded Character Sets to be used with Escape Sequences administered by the European Computer Manufacturers Association (114 Rue du Rhone, CH 1204 Geneva). Similarly standards need to be developed for displays of characters and graphics and pictorial information in video display units.

Media for Data Storage

34 Data can be exchanged in machine-readable form on magnetic tape and cassette, disks (both magnetic and optical versions), and directly via communications channels. Standards for exchange on magnetic tape exist, but no such standards are available for disk. However, some exchange formats being common to a number of system configurations should be used where possible. When none of these is directly applicable, use of a service centre which may exist within the region is suggested for conversion of physical formats.

Hardware Selection

35 Many of the microcomputers and personal computers on the market may not be suitable for data base applications that require mass storage and a high degree of processing power. In the selection of hardware, therefore, adequacy of mass storage capacity, sufficiency of processing power, availability of standard interfaces for data communication and of portable software (rather than a machine-bound software) should be among the criteria applied. Further, video screens supporting 80 columns and 24 lines of display shoud be selected as far as possible.

36 Recognizing that coordination of hardware selection offers significant benefits including

- building up a pool of expertise with certain systems in the region,
- potential for bulk purchase discounts,
- coordination of training programmes, and
- facilitation of maintenance agreements,

it is recommended that where no legal basis exists requiring coordination of hardware selection, Member Governments and/or professional societies be encouraged to establish groups to evaluate and recommend hardware available on the local market.

Systems Interconnection

37 Since at present standards exist only for certain aspects of the information transfer process, and the only standard available for all aspects of the process is the OSI model currently under development by the ISO, Member States in the region should use the OSI model in developing the information network.

Management Aspects

38 In order to ensure the wide dissemination and use of information and documentation standards in the countries of the region, Member States and professional societies should prepare and disseminate norms and standards documents in their respective national languages. They should also keep Unesco informed of their current mailing addresses and make all efforts to keep themselves informed about standards prepared and those in preparation by Unesco, ISO and other organizations.

Education and training

39 The development of education and training programmes and packages with reference to norms and standards are required at three levels:

1. General education - overview of standardization activities and available standards

2. Professional education -- e.g., bibliographic standards; and

3. Training for the application and implementation of specific standards.

Unesco, in collaboration with Member States and other agencies should help develop appropriate training/learning packages for each of these levels and ensure their inclusion in existing professional curricula for library/information science and archives administration.

40 Institutions in the region that have developed or are developing teaching/learning packages should coordinate their efforts by specifying the subject matter each wishes to cover and provide input to international efforts required to supplement regional activities.

Application/Adoption of Standards

41 National standards institutions should establish subgroups which will be directly concerned with the elaboration of national standards based on available international standards in information handling.

42 Within the framework of ASTINFO, a single working group should be established on information standards with experts and national representatives in the fields of computer hardware, information software, telecommunications and information systems and services. This working group should set up mechanisms for obtaining feedback on the application of standards in the countries of the region and communicate such information to appropriate standards development bodies. Further, the working group should identify and promote areas of activity of special interest to the countries of the region and requiring national input, for example, scripts.

Telecommunications and Network Development

43 With a view to get the regional network (ASTINFO) development started, it is recommended that Unesco initiate early action to prepare a project document detailing the network components, their functions, interconnection mechanisms,

management, funding, etc. Elements for such a project proposal are given in the attached report of the subgroup on Telecommunications and Networking.

44 Unesco in collaboration with Member States should identify institutions and organizations of the Asia and Pacific region (involved and/or interested in computer communications, data networks development and use, computerized information systems development, systems interconnection, data base production and information services provision, etc.) which will participate in the project as Centres of Regional Information Services (CRIS) or as Associated Centres (AC). The work is to be undertaken under Unesco contract by a consultant for 3 to 6 months (1/2 time) and completed by July 1984.

45 Unesco should nominate a project coordinator for the ASTINFONET about July 1984 for a period of 3-5 years.

46 The project coordinator should prepare a detalied technical project specification to be approved by the ASTINFO Regional Coordinating Committee. The preparation of the document may be completed by end of 1984.

47 The implementation of the ASTINFONET in the first phase will be in the form of a pilot project initiated in January 1985.

Report of the Sub-Group on Telecommunications and Networking

1. Introdution and Goals of the ASTINFONET Project

The effective implementation of the educational, scientific and cultural goals of the Unesco programme in the Asia Pacific Community can be made more efficient by a communications network linking Unesco affiliated organizations in the region. At the same time it must be realized that budgetary constraints preclude a rapid expansion of the conventional means of communication which are presently used by Unesco. And in much of this region the local ground-based infrastructure for operations is already near to capacity with communications generated by other high priority users. Therefore, the objective of this data network project (ASTINFONET) will be to take into consideration existing infrastructures and to supplement them so as to provide delivery and access systems which will serve the needs of the universities, libraries, and scientific and cultural institutions in the region. The project should concentrate on a network architecture appropriate to the needs of the people in the region, and a level of technology appropriate to the rapid development of small scale digital technology in the region. This means that the medium of telecommunications must rely on distributed control providing data communications to a large number of equal network participants. The telecommunications medium used must be pervasive to reach the libraries, universities and other institutions which may be located in national centres as well as in remote areas.

2. Objective of the Project

In the context of developing a network for the exchange of information in the Asia Pacific region to the present project is to be considered as a pilot or experimental activity designed to identify and evaluate the following:

A. the intercommunication possibilities using as far as possible existing infrastructure

B. the types of applications that may technically and economically be accommodated

C. the policy and organizational aspects of networking as they arise from the project.

Each of these objectives is outlined in more detail below:

A. There exists a number of communications facilities in the region which may be used as the basis of a wider network and in some cases are being used in a regional or subregional sense already. The communication objectives of this project are to connect, using existing infrastructures provided by the public communication authorities, national and international, a number of centres of existing expertise within the region to one another, using standard protocols, in order to evaluate the following:

- computer to computer communication - bilaterally
- terminal to computer communication - bilaterally
- receive only communication - computer to terminal
- communication between participants and external (outside the region) facilities.

B. There are many possible applications which could use a pilot or experimental communications network outlined in A above.

The objective of the project in this area will be to select a range of possible applications which may use the facilities and to evaluate the technical and economic aspects of each application with a view to their integration into a full scale network at some future time.

Among the applications to be considered should be the following:

- messaging and telecommunciation services
- document and identification and delivery services
- access to different facilities in the region
- access to external services
- data exchange between centres.

C. In a project of this nature involving organizations from a number of countries and with different structures there will be policy and organizational implications.

The objective of the project in this regard will be to involve directly and indirectly authorities - public and private - in the design, development and evaluation of the project. For this reason the relevant authorities — national and international — should be invited to participate actively in the running of the project. Furthermore, the existence of the project will be widely publicized so that those organizations who are not directly concerned are informed of the progress of the work and the results achieved.

It is expected that, as policy and organizational problems arise, they will first be discussed among the participants and, as necessary, communicated to other interested parties so that those aspects are fully understood and evaluated. The objective here is to ensure that future network activities are facilitated by mutual understanding and cooperation. In this context it should be pointed out that a subsidiary objective is to identify and clarify responsibilities among the different possible participants and authorities both nationally and regionally in the operation of a future regional network.

3. Recommendation

3.1 Network Participants

The network participants should be identified by Unesco as the first phase of the project. They will include the major libraries and centres of regional information services (CRIS) in the region, the research institutes and institutions active in the field of data communications, computerized information services, informatics, teleconferencing, data base production and provision, online services, etc. (For example, the Asian Institute of Technology and ESCAP in Thailand; the Tata Institute of Fundamental Research, the Indian Institute of Science, INSDOC, the Indian Space Research Organization, the National Aeronautical Laboratory and the Bharath Heavy Electricals in India; the Telecom Research Centre, the Universiti Sains and the Rubber Research Institute in Malaysia; the Asian Institute of Mass Communication and the Southeast Asia Computer Confederation in Singapore; the Technology Resource Centre, the International Rice Research Institute,

SEARCA/AIBA, and the National Science and Technology Authority in the Phillipines; the University of South Pacific in Fiji; CSIRO, AUSINET, and CRRERIS of Australia; the United Nations University, the University of Tokyo, Tsukuba University Science Information Center and JICST in Japan; KIET in South Korea; ISTIC, Northwest Telecommunication Research Institute and the Telecommunications Research Centre in China; the Eastwest Center and the University of Hawaii in Hawaii; the PEACESAT Consortium in Cook Islands). The participants will be advised of the details of the project and their viewpoints and recommendations called for to initiate the project.

3.2 Project Formulation

The project will have national and regional implications and the relevant communications requirements will have to be specified by the participants. Country studies of such requirements will be carried out and the volumes of traffic quantified for the present as well as those anticipated in future, say at 5-10 year intervals, for planning purposes.

Taking account of existing telecommunications infrastructures, a schematic plan of interconnection will be drawn up in consultation with the appropriate telecommunications authorities.

In drawing up the project proposals, care should be taken to ensure adherence to existing standards within the information processing and telecommunciations fields. The design will have adequate flexibility to permit all standard applications in the field of information processing with appropriate enhancement of the necessary equipment.

As an initial step toward project formulation, it is suggested that a Unesco/ITU/ESCAP workshop be convened with participants from the Asia Pacific region comprising both information and telecommunications specialists to establish a standard framework for project formulation and its subsequent implementation.

3.3 Implementation of an Experimental Data Communication Network

With regard to the strategy for implementation of a pilot project network in the field mentioned above, at present only preliminary ideas can be documented. The concrete implementation depends on a number of factors mentioned earlier, such as the clear identification of information use and users of the network, their technical implications, the identification of the key players in providing the necessary data communications infrastructure and technical realization. Much depends on factors such as what kind of hardware and software exist which could be used in some form or other, how could different systems be integrated into a single functional network, what financial and other types of resources are available, and so on.

At present, however, a recommendation on a possible line of implementation could be the following:

Since the system would be a pilot/experimental one and as inexpensive in financial terms as possible, and as it should be implemented at least in an "embryonic" way as early as possible in order to come closest to meeting the needs of the user groups, an appropriate technical solution could be as follows:

One line of consideration for such workable solution is interconnection of some of the centres mentioned in section 3.1. There is also a growing need for a regional network of information centres with links to external facilities via gateways. The setting up of these links between the existing international gateway machines would only require minor extension of their hardware and software which should be relatively cheap if one takes into consideration that no new infrastructure needs to be built up. As a new element, this international gateway would in an increasing way build up links to domestic host computers within the region. This trend would be very similar to the situation in Europe with regard to the introduction of international data services. Using this approach, from the population and business point of view, the most significant Asian and Pacific subregions could be covered.

The region may be different form the US and Europe in a sense that its geographic coverage is much greater and is covered largely by water. Thus, the inclusion of isolated dispersed groups into the experimental network would be another crucial aspect of the project.

An interesting aspect of the project because of its novelty would be the cooperation with a number of centres of excellence outside the region (such as information centres and services in the US, European universities, research centres, space agencies, research bodies), since the data communication problems of this region also offer them an exciting field of applied research.

The ASTINFONET pilot project is only an experimental one but could lead to the launching of similar public data services on a more permanent basis; therefore, from the very beginning all those 'players' who could offer their regular services within the framework established should become involved in the project in one way or the other. Connection with the different national PTT authorities but especially with their research institutions, if they exist, should be sought.

The outcome of the experimental network would be a temporary embryonic network with flexible (and probably mixed) technology that could be used to cover to a great extent the initial data communication needs of the region.

3.4 Project funding - resources

The budget for the initiation of the ASTINFONET pilot project is estimated to cost about 2 million US$ over a period of about 5 years.

Financial inputs to such a project should be negotiated with organizations such as those listed below. This input may be supplemented by other contributions coming from various organizations, participants, governments, bilateral and multilateral aid agencies.

a) UNDP (the United Nations Development Programme) should assist the project in the framework of its global activities such as the TCDC (Technical Cooperation among Developing Countries) or as a part of the budget foreseen for regional assistance.

b) ESCAP (the United Nations Economic and Social Commission for Asia and the Pacific) to facilitate scientific and technical information exchange and improve mutual understanding, cooperation and self-reliance among the peoples of the region.

c) ITU (the United Nations International Telecommunication Union) for the improvement of data transmission infrastructures in the region.

d) UNESCO for the general coordination of the project, the identification of possible participant organizations and financing of preliminary activities.

e) ADB (the Asian Development Bank) for the implementation of new communication infrastructures and technical assistance.

f) IDRC (the International Development Research Center of Canada) for the training of specialists in data transmission and information retrieval fields.

g) The governments of the Asia and Pacific region in which suitable participating centres will be identified, for the hosting of basic activities.

4. Tentative Schedule of Project Activities

The initial phase of the ASTINFONET pilot project may cover a period of five years including six months of preparatory activities. The tentative schedule for the project activities as far as the preparatory period is concerned could be as follows:

a) Identification of the organizations of the Asia Pacific region which will participate on the project as Centres of Regional Information Services

(CRIS) or as Associated Centres (AC), by a Unesco consultant:

six months (1/2 time) - mid 1984

b) Preparation of a project document including the required resources for the 5-year project lifetime (personnel, financial, equipment, subcontracts, etc.) by a Unesco consultant:

six months (1/2 time) - July 1984

c) Nomination of the ASTINFONET project coordinator

One project coordinator (5 years) - July 1984

d) Preparation of a detailed technical project specification under the responsibility of the project coordinator and with the approval of the ASTINFO Regional Coordinating Committee or other appropriate administrative body:

Technical document to be ready by December 1984

e) Beginning of the ASTINFONET pilot project - January 1985.

5. CONCLUDING SESSION

The reports of the three subgroups were presented, discussed and the recommendations amended and integrated.

The meeting then adjourned with a vote of thanks.

Distribution limited

PGI-83/CONF.801/INF.3
Paris, 31 August 1983

Annex 1

UNITED NATIONS EDUCATIONAL,
SCIENTIFIC AND CULTURAL ORGANIZATION

THIRD MEETING OF THE UNISIST WORKING GROUP ON TECHNOLOGY OF SYSTEMS INTERCONNECTION

Manila, Philippines, 17-20 October 1983

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PGI-83/CONF.801/INF.1

UNITED NATIONS EDUCATIONAL,
SCIENTIFIC AND CULTURAL ORGANIZATION

THIRD MEETING OF THE UNISIST WORKING GROUP ON THE TECHNOLOGY OF SYSTEMS INTERCONNECTION

Manila, Philippines, 17-20 October, 1983

List of Documents

Working Documents

Provisional agenda	PGI-83/CONF.801/1
Use of modern technology in information systems and services (Working document)	PGI-83/CONF.801.2

Background Documents

List of documents	PHI-83/CONF.801/INF.1
Telecommunication services for transfer of information and data: A case study in Indonesia	PGI-83/CONF.801/INF.2*
List of participants (provisional)	PGI-83/CONF.801/INF.3
Thailand: Telecommunication services for the transfer of information and data	PGI-83/CONF.801/INF.4
Regional network for the exchange of information and experience in science and technology in Asia and the Pacific (ASTINFO)	PGI-83/CONF.801/INF.5
Report of the Second Meeting (1980)	PGI-83/CONF.801/INF.6
Computer messaging systems	PGI-83/CONF.801/INF.7
IIASA TPA/70-X.25 Gateway-Network	PGI-83/CONF.801/INF.8

Other Reference Documents*

Use of satellite communication for information transfer. Paris, 1982. (PGI/82/WS/5)

Working document on scientific and technological information in Asia and the Pacific ... Paris, 1983. (PGI/83/WS/7)

IDNAC: Study report on the feasibility of an international databank for the non-aligned countries. Paris, 1982

Strategy for introducing new services (Singapore) by Sung Sio Ma (reprint Telecom. J. 50;1983;129-33)

Japanese telecom: Innovation and expansion by Charles E. White (reprint Telecommunications 1983 August;69-80)

*Available at the meeting in Manila

Annex 3

Opening Remarks by Mr.A.Neelameghan

Dr. Gurrero, Dr.Picache, Experts, Observers and guests

Allow me to welcome you, the participants and observers, on behalf of the Director General, to the Third Meeting of the UNISIST Working Group on the Technology of Systems Interconnection. Let me also express, at the outset, our gratefulness to the Government of the Philippines, especially to Minister Emil Javier and his officers of the National Science and Technology Authority and to Dean Picache and her colleagues of the University of the Philippines Institute of Library Science, for hosting this meeting and for making all the local arrangements. It was very gracious of Dr.Jose Guerrero, Director, Science promotion Institute, NSTA,
to be present at this opening session to welcome you all and to deliver thoughtful opening remarks. Unesco's Division of the General Information Programme (PGI) is primarily responsible for organizing this meeting and Director Tocatlian, though unable to come to Manila, has sent a message which I shall present you immediately after my opening remarks. We also have Mme Salman El-Madini my colleague from the Division participating in this meeting.

As indicated in our invitation, each of you will be participating in your personal capacity as an expert. The meeting has been convened to receive advice and recommendations from experts on practical measures to facilitate the transfer and exchange of scientific and technical information and data for development within and between countries especially of the Asia Pacific region. Among other things, you will examine the status of application of computer and telecommunications technology in information processing and transfer, data base activities, cooperative information networks and related systems and services in the region; identify needs, requirements and priorities; and you will make recommendations to strengthen weak links and fill in gaps. Your advice is crucial in formulating specific projects and activities of Unesco for the development of information systems and services in the Member States in the region in the next biennium 1984-1985; for, on the one hand, Unesco has assumed responsiblity and initiated action for implementing an important recommendation of the Second Meeting of Ministers Responsible for the Application of Science and Technology to Development and Those Responsible for National Economic Planning in Asia and the Pacific, held in Manila in March 1982 (CASTASIA II) for the establishment of a Regional Network for the Exchange of Information and Experience in Science and Technology in Asia and the Pacific (ASTINFO) and on the other, the programmes and budget of

Unesco for the biennium 1984-1985 will be discussed at the General Conference starting next Monday 25 October. Following the Conference decisions, specific projects and activities will be drawn up based on the needs and requests of Member States and recommendations of experts like those gathered here.

To facilitate your discussions some documents have been provided: Besides the working paper on the Use of Modern Technology in Information Systems and Services: Some Issues and Options ... for the Asia Pacific Region, background documents on the status of telecommunication facilities in some of the countries of the region, a survey of the information systems, services and programmes, etc. are available. Data base activities in the region will be reviewed in a summary report on the Asian Regional Seminar on Local Data Bases and Their Use that took place here last week. There will be short presentations on experiences in information systems networking, messaging systems, use of satellite in information dissemination in the Pacific countries, compatibility of systems, etc. Most important is the expertise assembled here to consider the problems and issues. Among the participants/resource persons we have specialists in information and data networks, telecommunications, computer applications in information handling, information services, systems compatibility, norms and standards and so on. We hope you will have opportunity to deliberate on the issues not only in plenary sessions but also in small groups. We eagerly look forward to your advice and recommendations.

Let me conclude by expressing thanks to you on behalf of Unesco, for accepting our invitation to come to Manila, a long way for most of you, to participate in this important meeting.

Annex 4

Dean PICACHE Uni. Philippines Inst.Library Sc. 3rd Floor 4 10 83
Main Library Build. QUEZON CITY Philippines

H0H77

FOR NEELAMEGHAN PLS DELIVER FOLLOWING MESSAGE TO THE MEETING :
EYE WISH TO BRING TO ALL OF YOU MY PERSONAL GREETINGS AND BEST WISHES FOR A VERY FRUITFUL MEETING STOP I TAKE THIS OPPORTUNITY TO REITERATE OUR GRATITUDE TO THE AUTHORITIES OF THE PHILIPPINES FOR HOSTING THE THIRD MEETING OF THE UNISIST WORKING GROUP ON THE TECHNOLOGY OF SYSTEMS INTERCONNECTION AND THANK EACH ONE OF THE PARTICIPANTS FOR HAVING ACCEPTED UNESCO'S INVITATION STOP WE ARE LOOKING FORWARD TO RECEIVING ADVICE AND RECOMMENDATIONS ON THE APPLICATION OF INFORMATION TECHNOLOGY TO FACILITATE THE STORAGE, TRANSFER AND EXCHANGE OF INFORMATION AND DATA IN GENERAL AND MOST PARTICULARLY IN ASIA/PACIFIC REGION IN THE FRAMEWORK OF ASTINFO STOP WITH WARM WISHES OF SUCCESS

TOCATLIAN

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X

J. TOCATLIAN

EP/PGI PGI/AO PGI

28.9.83

Annex 5

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PGI-83/CONF.801/1
Paris, 10 October 1983

UNITED NATIONS EDUCATIONAL
SCIENTIFIC AND CULTURAL ORGANIZATION

THIRD MEETING OF THE UNISIST WORKING GROUP ON TECHNOLOGY OF SYSTEMS INTERCONNECTION

Manila, Philippines, 17-20 October 1983

FINAL AGENDA

Monday 17 Oct.

- 09.30 - 12.30	Opening Session	Opening remarks by the Representative of the National Science and Technology Authority Philippines Opening remarks by the Representative of the Director-General, Unesco Nomination of Chairman, Vice-Chairman and Rapporteur(s) Remarks by Chairman and adoption of Agenda Presentation of report of the Asian Regional Seminar on Local Data Bases (Manila, 10-14 Oct. 1983), Jose-Marie Griffiths
- 14.00 - 15.30	Technical Session I (Plenary)	Presentation of Working Paper, F.V. Mahon
- 16.00 - 17.30	Technical Session II (Plenary)	Brief reports: PEACESAT (Kingan) IIASA and information networks (Sebestyen) Computerized Message Systems (Tarouco)

Tuesday 18 Oct.

- 99.00 - 12.30	Technical Session III (Plenary)	Brief reports (cont.) Intelligent videotext decoders and new generation videotext in the field of technical information and documentation (Sebestyen)

		Demo: PEACESAT (Kingan)
		Japanese scientific information network (Tsbata)
		Telecommunications - Thailand (Seshasayee)
		Data communications in Australia (Judge)
		Other reports on networks and telecommunications
- 14.00 - 15.30	Technical Session IV (Plenary)	Systems Compatibility Simmons Koch Romerio
		Others
- 16.00 - 17.30	Technical Session V	Identification of specific issues for small group discussion and recommendations

Wednesday 19 Oct.

- 09.00 - 12.00	Discussion of issues in small groups
- 14.00 - 16.00	Presentation of reports by groups

Thursday 20 Oct.

- 09.00 - 13.00	Consideration of draft report and recommendations
	Closing of the Meeting

Annex 6

UNESCO - UPILS ASIAN REGIONAL SEMINAR ON LOCAL DATA BASES AND THEIR USE

SUMMARY OF PROCEEDINGS

Diliman, Quezon City, 10 - 14 October 1983

1. INTRODUCTION

01 The Asian Regional Seminar on Local Databases and their use, held in Quezon City from 10 to 14 October, 1983 was jointly sponsored by Unesco And the University of the Philippines, Institute for Library Science (UPILS). The seminar participants and observers represented 13 countries in the region. To support the meeting through their experience and expertise in the area of local database developments and needs six resource persons were invited to attend the meeting. A list of participants, observers, resource persons and the seminar secretariat is provided in Annex 1.

2. OPENING SESSION

02 The session was opened by NATCOM representative who extended a warm welcome to the international group to the Phillipines on behalf of Mrs. Alicia Coseteng, Executive Secretary, Unesco National Commission of the Phillipines. Following these welcoming remarks Professor A. Neelameghan expressed his welcome to those present and provided some information on the sequence of events that led up to the seminar. A telex message to the participants of the seminar from Kenneth Roberts of Unesco was read by Professor Neelameghan (Annex 2). Professor Rosa Vallejo (UPILS) introducted the guest speaker, Dr. Quintin L. Kintanar, Deputy Director-General, National Science and Technology Authority of the Phillipines. Dr. Kintanar talked of the importance of developing databases for local use and cited his own heavy reliance on information. He also stressed the importance of new technologies to support needed information services. The session was concluded by Dr. Ursula Picache, Dean, Institute of Library Science who expressed great satisfaction in seeing her proposal for the seminar come to fruition and with such a broad geographic representation.

3. TECHNICAL SESSIONS

03 The programme for the Seminar included four technical sessions in which participants and resource persons reported on the state of local database developments and use in their countries. The reports were also available

in written form (see list in Annex 3). The Technical Sessions were supplemented by visits to local institutes and organizations in and around Manila which were actively engaged in database development and use. During the course of the seminar a tremendous amount of information was exchanged, generally increasing the awareness of the extent and range of database activity in the Region and specifically addressing potential problems and solutions.

04 In reviewing the various reports and presentations it became clear that local databases - that is, generated by local centres - can be divided into two categories:

a) databases of national scope aiming at serving national institutions or covering topics of specific significance for the country

b) databases of regional or international scope covering topics of interest to a large group of countries.

a. Databases of national significance

1. Library databases - focussing on the holdings of a library (e.g., the database of the National University of Singapore and ESCAP) or of a group of libraries (e.g., union catalogues, union lists of serials, or lists of documents such as those found at the Universiti of Sains Malaysia; AIT and the University of Chulalongkorn, Thailand; INSDOC, India; PASTIC, Pakistan; KIET, Korea; etc.

2. Database covering activities at a national level - for example:

   - ongoing research -- PASTIC, Pakistan; INSDOC, Indian; KIET, Korea; PCARRD and NSTA, Phillipines;
   - testing facilities — India
   - Chinese pharmaceutical abstracts — People's Republic of China
   - presidential decrees — Phillipines
   - patents - Phillipines
   - human settlements — Phillipines
   - science and technology — NSTA, Phillipines, PASTIC, Pakistan;

- statistics — Indonesia
- remote sensing — Indonesia
- industry and commerce - Malaysis
- narcotics — Malaysia

b. Databases of regional or international significance

1. Operated at single regional centres - such as ESCAP, Bangkok, for trade, demography, economic and social statistics

   - IRRI, Phillipines, for rice
   - Hong Kong Chinese University for medicinal plants
   - AIT, Thailand, for geotechnical engineering, ferrocement, renewable energy resources, environmental sanitation
   - SEAPRINT — regional database of selected imprints of the ASEAN countries
   - Rubber Research Institute of Malaysia, for rubber

2. Generated through regional networks - such as:

   - AGRIASIA and CARIS/ASIA, at AIBA, Phillipines for agriculture
   - AQUIS at SEAFDEC, for aquaculture
   - CRRERIS at CSIRO, Australia, for renewable energy resources.

Databases serving national requirements are fairly numerous, whereas those having a broader significance are fewer, especially those built through cooperative networking activities.

4. PROBLEMS IDENTIFIED

05 In reviewing the various activities reported in the presentations it became clear that the term "local databases" had been interpreted in many different ways. In some cases the term referred to datbases accessible

locally, for example the provision of retrospective information retrieval and SDI services from tapes of databases acquired from external sources and mounted on locally available systems. In other cases the term referred to databases containing information about local holdings, for example automated catalogues of monograph and serial holdings. Finally, in some cases the term referred to locally generated information, for example information about local research projects. These different interpretations of the same phrase led to a certain amount of confusion in the ensuing discussions. However, for the identification of potential problems that might be encountered in building local databases, the term was defined to mean databases describing locally produced information only.

06 Many of the presentations briefly described in the previous section addressed problems that had been encountered in the development of local databases and related services and products. The following categories of problems were identified:

- Managerial Problems
- Hardware Interconnection Problems
- Software Related Problems
- Data Communications Problems
- Microcomputer Related Problems
- Marketing Management Problems

4.1 Managerial Problems

07 This category of problems refers to the management of local databases development activities. It is a class of problems that is often overlooked for the more technical problems associated with hardware, software or communications. Nevertheless, the correct management of database development is critical to the success of local database projects and, if not paid attention to, can often have detrimental effects on service provision.

08 The most frequent problem that was encountered was that the actual development and implementation of systems to support and maintain local databases was carried out by data processing personnel with relatively little input from the information personnel. This tended to result in the

development of non-standard systems, thereby restricting the potential future exchange of information. This is not a new problem, but if appropriate information systems are to be developed with a view to information resource sharing in the region, then information personnel must take the responsibility for making data processing personnel aware of the special requirements of bibliographic information systems, and of the existence of international standards for exchange of bibliographic information.

09 Another noticable problem was the apparent lack of any user input to the design of local database systems. Although many of the systems demonstrated were introduced as "user friendly" they in fact required a considerable understanding of the structure of the system and of command formats required by the system.

10 Very little information was available about users at all. Those offering various information products and services had no information about the amount of use, types of use, extent of non-use, etc. The potential danger of developing systems and services without regard for the end user of the information provided is the development of systems and services that can only be used by a small handful of information people. In fact if information systems and services are not used by those for whom they are intended, then one must seriously question their overall utility. If a system or service is established, then measures should be taken to maximize its use. Only in this way can the full value of service be recognized.

11 We, therefore, consider the gathering of information about the actual (and potential) users of local database systems and services to be a priority for future development. In an automated environment usage data can be gathered relatively easily through a system monitoring program, and can be supplemented through a survey of users. For those situations where a database is being created for the first time and there is no user population yet, information should be sought from other similar database activities in the region which can be used as preliminary models for development. As soon as a database service becomes operational, however, data about actual usage should be gathered in an ongoing fashion.

12 Such statistical usage date, in addition to providing direction for future developments can also be extremely useful in obtaining institutional or higher level commitment ot the provision of information services based on local and other databases. Many types of support can be solicited, ranging from financial support, to the provision of appropriately skilled personnel, to the coordination of promotional activities stressing the importance of information provision to development.

13 One final issue to be addressed in this category is the question of charging for information services and products. Recognizing a delicate set of relationships linking value to cost to price to use, it was nevertheless felt that charging for information services and products would lead to a greater appreciation for the information provided and an increased perception of the value of information, information products and information services. The price/use relationship is a particularly sensitive one and some guidelines on how to price services and products is needed.

4.2 Hardware Interconnection Problems

14 The various presentations identified a variety of computer hardware configurations being used to support local database activities. These included IBM configurations, Hewlett Packard configurations, UNIVAC configurations, and an increasing variety of microcomputer configurations throughout the region.

15 Recognizing that many of the problems of hardware interconnection are being addressed (see Report of the Second Meeting of the UNISIST Working Group on Technology of Systems Interconnection) we do not consider hardware interconnection itself as an insurmountable problem. Most of the hardware interconnection problems will be derived from telecommunications infrastructure problems. However, we did see instances of locally created hardware interfaces being used rather than standard interfaces. International standards for hardware interconnection do exist and should be adopted whenever possible. Information about existing standards can be

found in the UNISIST Guide to Standards (which is in the process of being updated and expanded) and from the ISO Standards Handbook, both available to member states through UNESCO.

16 Another problem relating to hardware is the potential for "vendor lock-in", i.e. the building up of a total dependency on a single hardware vendor. This problem also relates to the problems addressed in the previous subsection of having automated systems development under the control of data processing units rather than the information units. Again, care should be taken not to restrict or cut off future development possibilities by using vendor specific interfaces.

17 Finally, hardware selection and acquistion may be controlled and/or restricted at the national level, wich may or may not reflect the best interests of information related activities. Again, every opportunity to increase the recognition of the importance of information for development should be seized.

4.3 Software-Related Problems

18 The various database development activities described during the seminar identified both the application of available packaged software as well as in-house developed software. It was agreed during the discussions that the use of packaged software was in the long term, more beneficial because packages tended to be based on existing standards, whereas software developed in-house rarely incorporated any bibliographic standards. The acquisition of packaged software is also less expensive (although the costs of in-house development and maintenance may be hidden rather than apparent costs).

19 The major problem faced by those who wish to develop local databases and local database services is the identification and selection of appropriate software to support such services. UNESCO will soon publish its software inventory (in early 1984), and many other sources of information about software currently exist (including the professional literature).

However, there is a need to establish guidelines for selection of software which demonstrate the implications for future development of selecting various software features (e.g., fixed length fields, etc.).

20 The selection of software should not be left to the data processing personnel but should be a joint activity of information and data processing personnel. Packages which are written in high level languages should be selected over those that are more machine dependent. Activities to develop machine independent packages (such as IMD's IV + V development in Austria) should be closely monitored.

21 Finally, a number of other activities relating to software could be initiated in the region, including the development of a resource directory of people with experience with different software packages within the region (e.g, there exists both MINISIS and CDS/ISIS experience in the region), an effort to develop better user documentation, and the development of more user friendly software.

4.4 Data Communications Problems

22 The lack of adequate national telecommunications infrastructures within the region was addressed by several of the participants. Where such infrastructures did exist, the tariffs for use were very high. This is a problem which needs to be addressed at the National PTT level, and some activity in this area is already planned by UNESCO for early 1984.

23 However, in addition to the basic telecommunications problem, the systems that we saw were not designed to be accessed by remote slow speed terminals. In developing local database systems care should be taken to ensure access by a variety of terminal types.

24 Finally, as an interim solution at least, the design of systems to communicate via telex should be considered.

25 We expect to see continued exchange of information via transportable media such as magnetic tape. However, we see no immediate development of

standards for exchange of information on disks (floppy disks or optical disks). For microcomputer applications exchange of information can be handled via microcassettes more easily than via floppy disks.

26 We recognize that the exchange of information in machine-readable form across national boundaries could pose major problems with customs and postal services, and recommend a move to extend the Florence Agreement from printed materials to include various other media of exchange.

4.5 Microcomputer Related Problems

27 Many of the problems identified in the three previous subsections - hardware interconnection, software and data communications - also apply to microcomputers, but it was felt that the influx of microcomputer technology into the region poses some particular problems as well as some potential solutions.

28 First, many of the local database applications described are ideally suited to microcomputers. Such applications however should be implemented only on microcomputers with Winchester disk technology. As mentioned earlier we envisage exchange of information via microcassette rather than floppy disks.

29 Another major problem with microcomputers (and other hardware) is the donation of equipment to organizations by vendors, manufacturers, etc. Attempting to use donated equipment for local database applications may result in many compromises in system design and software selection and, in the long term, may lead to a much greater system development cost than would be incurred by acquiring a more suitable choice of hardware and software. Donated equipment can be used for many purposes but its applicability for local database development should be carefully evaluated.

30 Finally, the greatest problem associated with a large-scale influx of microcomputers into the region is the lack of adequately skilled personnel.

A full-scale education and training programme needs to be established in the region to educate people about the capabilities, limitations and potential applications of microcomputers for information handling, and to train people in the use of specific systems.

4.6 Marketing Management Problems

31 This category of problems relates to the fact that all of the local databases described in the presentations seemed underutilized, or else no information regarding usage was available. Once again it should be stressed that if efforts are made to gather locally produced information and to provide access to that information via local databases then similar levels of effort should be expended in maximizing use of the databases. This can be done through various promotional activities, advertising, demonstrations, open houses, etc.

32 Related to these activities should be the collection of information about users and their use of the databases. Such information will lead to the development of more useful and appropriate databases for a given set of users. An important aspect of local database developments and the marketing and promotion of local databases is the clear definition of objectives (why is the database being developed? for whom? etc.).

33 Databases should also be promoted as part of a larger information service providing, for example, document delivery service. Access to local databases (or any databases for that matter) is relatively useless if the documents referred to cannot be acquired. It is important in developing local databases to ensure that locally generated documents are available through back-up services.

34 Finally, charging for information should be seriously considered (see section 3.1 for a full discussion of charging).